

What is Claimed is:

1. A gas compressor for sucking in, compressing, and discharging refrigerant gas, the gas compressor comprising:

an elliptical cylinder;

a rotor rotatably arranged in the cylinder;

vane grooves radially formed in the rotor;

vanes provided in the vane grooves and capable of projecting and retracting radially with respect to the rotor;

a flat groove adapted to communicate with vane groove bottom portions during a refrigerant gas sucking/compressing process;

a high pressure supplying hole adapted to communicate with the vane groove bottom portions upon interception of the communication between the vane groove bottom portions and the flat groove in the refrigerant gas compressing process; and

a communication passage adapted to establish communication between the flat groove and the high pressure supplying hole at the start of the gas compressor.

2. A gas compressor according to claim 1, further comprising:

an exhaust chamber for temporarily storing refrigerant gas discharged from the cylinder;

an oil sump formed in a lower portion of the exhaust chamber;

a first supplying passage establishing communication between the oil sump and the high pressure supplying hole; and

a second supplying passage branching off from the first supplying passage and communicating with the flat groove,

wherein the communication passage is formed by the first supplying passage and the second supplying passage.

3. A gas compressor according to claim 1, further comprising:

a first pressure control valve which is provided in the communication passage and adapted to be brought into a closed state when the difference between a pressure in the exhaust chamber and a pressure in the flat groove becomes not less than a predetermined value.

4. A gas compressor according to claim 2, further comprising:

a first pressure control valve which is provided in the second supplying passage and adapted to be brought into a closed state when the difference between a pressure in the exhaust chamber and a pressure in the flat groove becomes not less than a predetermined value.

5. A gas compressor according to claim 2, further comprising:

a second pressure control valve which is provided in the first supplying passage on the downstream side of the oil sump and on the upstream side of a branches off point for the second supplying passage, and adapted to be brought into the closed state when the

difference between the pressure in the exhaust chamber and a pressure at the branches off point for the second supplying passage becomes not more than a predetermined value.

6. A gas compressor according to claim 4, further comprising:

a second pressure control valve which is provided in the first supplying passage on the downstream side of the oil sump and on the upstream side of a branches off point for the second supplying passage, and adapted to be brought into the closed state when the difference between the pressure in the exhaust chamber and a pressure at the branches off point for the second supplying passage becomes not more than a predetermined value.

7. A gas compressor according to claim 2, further comprising:

a third supplying passage situated on the downstream side of the oil sump and branching off from the first supplying passage on the upstream side of the branches off point for the second supplying passage; and

a second pressure control valve situated in the first supplying passage and between the branches off point for the second supplying passage and a branches off point for the third supplying passage and adapted to be brought into the closed state when the difference between the pressure in the exhaust chamber and the pressure at the branches off point for the second supplying passage is not more

than a predetermined value.

8. A gas compressor according to claim 4, further comprising:

a third supplying passage situated on the downstream side of the oil sump and branching off from the first supplying passage on the upstream side of the branches off point for the second supplying passage; and

a second pressure control valve situated in the first supplying passage and between the branches off point for the second supplying passage and a branches off point for the third supplying passage and adapted to be brought into the closed state when the difference between the pressure in the exhaust chamber and the pressure at the branches off point for the second supplying passage is not more than a predetermined value.

9. A gas compressor according to claim 4, further comprising:

a third supplying passage further branching off from the branches off point for the second supplying passage and adapted to supply lubricant to a front portion of the interior of the gas compressor main body; and

a third pressure control valve situated at a position in the gas compressor main body in front of the oil sump and inside the third supplying passage behind the branches off point and adapted to be brought into the closed state when the difference between

the pressure in the exhaust chamber and a pressure in the third supplying passages is not more than a predetermined value.

10. A gas compressor according to claim 5, further comprising:

a third supplying passage further branching off from the branches off point for the second supplying passage and adapted to supply lubricant to a front portion of the interior of the gas compressor main body; and

a third pressure control valve situated at a position in the gas compressor main body in front of the oil sump and inside the third supplying passage behind the branches off point and adapted to be brought into the closed state when the difference between the pressure in the exhaust chamber and a pressure in the third supplying passages is not more than a predetermined value.